

IN THE CLAIMS

The listing of claims replaces all prior versions, and listings, of claims in the application.

1. (Previously presented) An apparatus comprising:
an intravascular device to perform a therapeutic treatment; and
at least one optical fiber disposed within a coil-like enclosure which concentrically surrounds the at least one optical fiber and disposed within the intravascular device, and the at least one optical fiber is bonded to at least one point along an inner surface of the coil-like enclosure, the at least one optical fiber configured to provide diagnostic information at least one of before, during, and after the therapeutic treatment.
2. (Currently amended) The apparatus of claim 1 wherein the at least one optical fiber is configured to be inserted within a vasculature and exposed at least at one location along the intravascular device.
3. (Currently amended) The apparatus of claim 2 wherein the at least one optical fiber is configured to sense vessel and blood characteristics.
4. (Original) The apparatus of claim 3 wherein vessel and blood characteristics are selected from the group consisting of hemodynamic characteristics, hematological parameters related to blood and blood components and thermal parameters of the vasculature.
5. (Previously presented) The apparatus of claim 1 wherein the intravascular device is a balloon catheter comprising:
a catheter shaft having an elongated outer member disposed about a tubular inner member, the tubular inner member having a lumen to receive the at least one optical fiber therethrough; and

a balloon coupled to a distal portion of the catheter shaft for dilating a stenosed vessel.

6. (Canceled)

7. (Currently amended) The apparatus of claim 5 wherein the at least one optical fiber is movable within the lumen.

8. (Previously presented) The apparatus of claim 5 wherein the lumen is configured to receive an inflation medium therethrough to inflate the balloon.

9. (Currently amended) The apparatus of claim 8 wherein a distal tip of the at least one optical fiber is configured to be inserted within a vasculature and exposed at least at one location along the balloon catheter.

10. (Previously presented) The apparatus of claim 9 wherein the at least one optical fiber is configured to sense vessel and blood characteristics selected from the group consisting of hemodynamic characteristics, hematological parameters related to blood and blood components and thermal parameters of the vasculature.

11. (Previously presented) The apparatus of claim 5 wherein the tubular inner member has a second lumen extending at least within a distal portion of the tubular inner member, the second lumen being substantially parallel to the lumen having the at least one optical fiber therethrough.

12. (Original) The apparatus of claim 11 wherein the second lumen is a lumen selected from the group consisting of guidewire lumen, inflation lumen, radiation source lumen, drug delivery lumen, atherectomy device lumen and laparoscopy lumen.

13. (Currently amended) The apparatus of claim 12 wherein a distal tip of the at least one optical fiber is configured to be inserted within a vasculature and exposed at least at one location along the balloon catheter.

14. (Previously presented) The apparatus of claim 13 wherein the at least one optical fiber is configured to sense vessel and blood characteristics selected from the group consisting of hemodynamic characteristics, hematological parameters related to blood and blood components and thermal parameters of the vasculature.

15. (Previously presented) A catheter comprising:
a catheter shaft having an elongated outer member disposed about a tubular inner member and an intraluminal gap extending longitudinally between the outer member and the inner member; and
at least one optical fiber disposed within a coil-like enclosure which concentrically surrounds the at least one optical fiber and disposed within the intraluminal gap, the at least one optical fiber being bonded to at least one point along an inner surface of the coil-like enclosure, the catheter capable of both diagnostic and therapeutic purposes.

16. (Original) The catheter of claim 15 further comprises an inflatable balloon coupled to the catheter shaft.

17. (Original) The catheter of claim 16 further comprises at least one lumen longitudinally extending through the tubular inner member.

18. (Original) The catheter of claim 17 wherein the at least one lumen is selected from the group consisting of guidewire lumen, inflation lumen, radiation source lumen, drug delivery lumen, atherectomy device lumen and laparoscopy lumen.

19. (Currently amended) The catheter of claim 15 wherein a distal tip of the at least one optical fiber is configured to contact[[s]] a vasculature at least at one location along the catheter.

20. (Original) The catheter of claim 19 wherein the at least one optical fiber is configured to sense vessel and blood characteristics selected from the group consisting of hemodynamic characteristics, hematological parameters related to blood and blood components and thermal parameters of the vasculature.

21. (Original) The catheter of claim 15 wherein a distal portion of the at least one optical fiber comprises a radiopaque substance.

22. – 31. (Canceled)

32. (Previously presented) A system for sensing vessel and blood characteristics, the system comprising:
a data processing system; and
an apparatus coupled to the data processing system, the apparatus comprising an intravascular device to perform a therapeutic treatment and at least one optical fiber disposed within a coil-like enclosure which concentrically surrounds the at least one optical fiber and disposed within the intravascular device, and the at least one optical fiber is bonded to at least one point along an inner surface of the coil-like enclosure, the at least one optical fiber configured to provide diagnostic information at least one of before, during, and after the therapeutic treatment.

33. (Currently amended) The system of claim 32 wherein a distal tip of the at least one optical fiber is configured to contact[[s]] a vasculature at least at one location along the intravascular device, the optical fiber configured to sense vessel and blood characteristics selected from the group consisting of hemodynamic characteristics, hematological parameters related to blood and blood components and thermal parameters of the vasculature.

34. – 43. (Canceled)

44. (Previously presented) A catheter, comprising:
a catheter inner shaft member having a first lumen, an optical fiber within the first lumen, the optical fiber disposed within a coil-like enclosure which concentrically surrounds the optical fiber and the optical fiber is bonded to at least one point along an interior surface of the coil-like enclosure, a second lumen adapted to receive a guidewire, and a third lumen adapted to received a therapeutic drug, wherein the optical fiber is configured to provide diagnostic information at least one of before, during, and after a therapeutic treatment.

45. (Original) The catheter of claim 44, wherein a tapered mandrel is disposed near a distal end of the first lumen to provide support to the catheter inner shaft member.

46. (Original) The catheter of claim 44, further comprising an inflatable balloon coupled to the catheter inner shaft member, and wherein the third lumen is also adapted to receive an inflation medium.

47. (Canceled)

48. (Previously presented) An apparatus comprising:
a trackable intravascular device that can bend to perform a therapeutic treatment;
a proximal end of the trackable intravascular device, the proximal end configured to send at least one light signal and receive detected light from a distal end of the trackable intravascular device;
the distal end configured to send the at least one light signal being received from the proximal end and also receive detected light from a target;
at least one optical fiber disposed within a coil-like enclosure which concentrically surrounds the at least one optical fiber and disposed within the

intravascular device, and the at least one optical fiber is bonded to at least one point along an inner surface of the coil-like enclosure, the at least one optical fiber configured to provide diagnostic information at least one of before, during, and after the therapeutic treatment; and

an optical window at the distal end that allows optical transmission or reception of light through the optical fiber.